



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,687	01/18/2002	Satoshi Watanabe	5576-137	3765

20792 7590 09/10/2003

MYERS BIGEL SIBLEY & SAJOVEC  
PO BOX 37428  
RALEIGH, NC 27627

EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
----------	--------------

1752

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

10/052,687

Applicant(s)

WATANABE, SATOSHI

Examiner

Yvette C. Thornton

Art Unit

1752

-- The MAILING DATE of this communication appears in the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### DETAILED ACTION

This is written in reference to application number 10/052687 filed on January 18, 2002 and published as US 2002/0136981 on September 26, 2002.

#### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### *Information Disclosure Statement*

2. The Information Disclosure Statement filed on January 18, 2002 has been entered and fully considered.

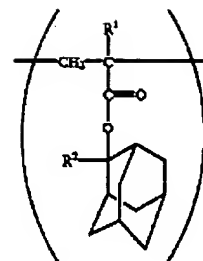
#### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US 6406830 B2). Inoue teaches a chemically amplifying type positive resist composition comprising an aliphatic sulfonium salt represented by the following formula (I); at least one onium salt selected from the group consisting of triphenylsulfonium salt and diphenyliodonium salt; and a resin which contains a polymerization unit having a group unstable to an acid (abstract). The preferred polymerization unit is 2-alkyl-2-adamantyl

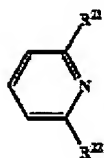
Art Unit: 1752



(meth)acrylate and is specifically represented by the formula (III)

wherein

R1 represents a hydrogen or methyl group and R2 represents an alkyl group (c. 7, l. 6-30). It is the examiner's position that the 2-alkyl-2-adamantyl (meth)acrylate unit meets the limitations of a resin protected with an acid labile group and has an alicyclic structure having a CO--O(CO) group wherein k is 0. Inoue further teaches that performance deterioration due to deactivation of an acid associated with leaving after exposure can be reduced by adding a basic compound. Among the taught basic compounds 2,6-dialkylpyridine



compounds of formula X

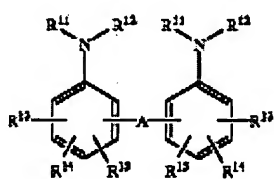
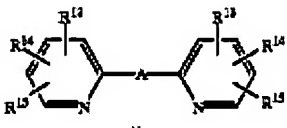
are preferable for improving the storage stability of the

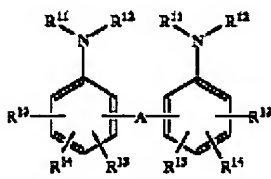
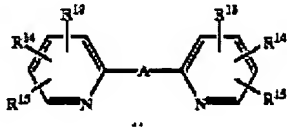
resist. The said compound can be used alone or together with other basic compounds (c. 13, l. 1-19). The composition may also contain, if required, various additive such as sensitizers, dissolution inhibitors, surfactants, stabilizers and dyes so far as the objects of the present invention is not harmed (c. 13, l. 30-36). The taught components are dissolved in an organic solvent such as acetone, 2-heptanone and cyclohexanone to make a resist composition which is applied to a substrate, dried, exposed, heat-treated and then developed to form a positive pattern (c. 38-60). Example 1 exemplifies a process herein the coated substrate is irradiated with an ArF excimer stepper through a line and space pattern, changing stepwise the exposure

Art Unit: 1752

amount (c. 18, l. 20-31). The said line and space pattern meets the limitation of a photomask as set forth in instant claims 9-16.

Inoue teaches all the limitations of the instant claims except it fails to explicitly discuss the use of at least one compound selected from the group consisting of thiol derivatives, disulfide derivatives and thiol-sulfonate derivatives as set forth in the instant claims. Inoue does however teach that the taught preferred 2,6-dialkylpyridine basic compound can be used alone or in combination with other basic compounds. Examples of

other basic compounds include  and  wherein A represents alkylene, carbonyl, imino, sulfide or disulfide (c. 11, l. 66-c. 12, l. 67). It is the examiner's position that the limitations of the instant claims are met when A is a sulfide or disulfide. One of ordinary skill in the art would have been motivated by the teachings of Inoue to incorporate an additional basic compound such as those represented by formula

 and  wherein A represents a sulfide or disulfide

group in order to optimize the reduction in performance deterioration due to the deactivation of an acid associated with leaving after exposure (c. 11, l. 66-c. 12, l. 4).

Art Unit: 1752

*Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Uetani et al. (US 2001/0044070 A1) pertaining to a chemically amplified positive resist composition.
- Seki et al. (US 6395446 B1) pertaining to resist compositions and patterning processes.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

8. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.

  
Yvette Clarke Thornton  
Junior Examiner  
Art Unit 1752

yct  
September 5, 2003